REMARKS

The claims were rejected under 35 U.S.C. 102(b) and/or 103(a) as being anticipated by or unpatentable over Baughman and other references.

In a general response;

The Baughman patent has a single set of drawings which show the window unit of the specification consisting of a pane [8] to which a liquid crystal cell [14] is adhesively attached, and a second pane [6] fastened in a frame [5] to the first with a gas space [10] for thermal break (col. 1 lines 51-53).

The reference provides an electro-optical shade of adjustable light transmittance as an integral part of a dual-pane thermal window unit. The window unit comprises two nonintersecting and, preferably, substantially parallel, spaced window panes, mounted in a window frame, a first of the panes having affixed thereto a first wall of an electro-optical liquid crystal cell providing a selected light transmittance, and a second of said panes delimiting, with a second wall of said cell, a space providing a thermal break (col. 1 lines 56-63).

In use of the reference, the window unit [1] may be mounted in hinged and thermally sealed fashion over the inside of an existing window. The window unit is preferably placed so that the thermal barrier (pane 6) is towards the outside and (pane 8) to which the cell containing liquid crystal material is affixed is towards the inside. Since many of the liquid crystal compositions and optical polarizer elements degrade upon exposure to ultraviolet light found in the solar spectrum and since glass is a good absorber of ultraviolet light, incorporation of the liquid crystal element on the building interior inside of a glass pane is preferred (col. 7 lines 26-37).

Alternatively, or for new construction in the reference, the window unit 1 may be used alone without a conventional window. Thus, the user is afforded in one unit a storm window and an electro-optical shade having variable light transmittance, selectable at the user's option (col. 7 lines 51-55).

In still another embodiment, shown in FIG. 5 of the reference, the window unit can comprise a plurality of nonintersecting or, preferably, substantially parallel, spaced window panes 6, 8, 16; a plurality of liquid crystal cells 14, 14', each of the cells being affixed to a different one of the panes; and a plurality of thermal breaks 10, 10', each of the thermal breaks being a space delimited between a wall of each of the cells and a face of each of the panes. The

number of thermal breaks afforded by this embodiment of the window unit is generally two; one less than the number of panes employed. It will be understood, however, that window unit constructions can be readily produced wherein more than two thermal breaks are achieved, as in the order of up to ten or more thermal breaks per unit. The provision of multiple thermal breaks affords an energy saving feature that renders the unit more cost effective than window units having a single thermal break (col. 8 lines 31-48).

As clearly recognized from the passages of the reference; col.7 lines 26-37 and col. 7 lines 51-55, the reference describes the whole unit even as an add on. This point is clearly shown in the drawings.

In contrast, the present invention is about a separate window component, which can be applied or attached to endow the effect of the present invention to any conventional regular window. In addition, the window component of the present invention does not have to be sandwiched between window panes. Since it is an independent item, the window component can be attached to the surface of a window.

Item by item responses is given below:

Claims 13-20, 23-28 and 43 were objected because of minor informalities.

In response, the applicant added the nonlinear optical material to claims 13-20 following the Examiner's suggestion.

Claims 1-3, 5-13, 19, 37-45, 47-50 and 53 were rejected under 35 U.S.C. 102(b) as being anticipated by Baughman (US 5,197,242).

In response, the applicant amended claims 1-3, 7-13, 19, 37-45, 47-50 and 53 and cancelled claims 5-6 in order to make clear the invention, which is different from the Baughman reference. Especially, claim 1 is amended to define the invention as a window component, not a window itself. The window component, according to the present invention does not need the glass of a dual pane window to realize the invention, and therefore may be able to be applied or attached to a conventional regular window pane to get the effects of the present invention. On the contrary, according to the reference, Baughman's invention of the thermal window is a window itself.

Claims 4, 14-18, 20, 51 and 52 were rejected as being unpatentable under 35 U.S.C. 103(a) over Baughman.

In response, the applicant amended claims 4, 14-18, 20, 51 and 52 to make clear the window component as a separate item from the window. Since the invention is not anticipated by the reference, the applicant respectfully argues that the obviousness of the dependent claims does not hold any more.

Claims 21-30 were rejected as being unpatentable under 35 U.S.C. 103(a) over Baughman in view of Xu (US 5,638,200, '200 hereinafter).

In response, the applicant amended claims 21-30 to make clear the window component as a separate item from the window. Since the invention is not anticipated by the reference, the applicant respectfully argue that the obviousness of the dependent claims does not hold any more.

Claims 31-35 were rejected as being unpatentable under 35 U.S.C. 103(a) over Baughman in view of Xu and Kataoka (US2002/0005918).

In response, the applicant amended claims 31-35 to make clear the window component as a separate item from the window. Since the invention is not anticipated by the reference, the applicant respectfully argues that the obviousness of the dependent claims does not hold any more.

Claim 36 was rejected as being unpatentable under 35 U.S.C. 103(a) over Baughman in view of Xu, Kataoka and Tungare (US2003/0013129).

In response, the applicant amended claim 36 to make clear the window component as a separate item from the window. Since the invention is not anticipated by the reference, the applicant respectfully argues that the obviousness of the dependent claims does not hold any more.

Claim 46 was rejected as being unpatentable under 35 U.S.C. 103(a) over Baughman in view of Love (US6,536,828).

In response, the applicant amended claims 46 to make clear the window component as a separate item from the window. Since the invention is not anticipated by the reference, the applicant respectfully argues that the obviousness of the dependent claims does not hold any more.

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Att'y Docket: 1765.01

CONCLUSION

The applicant believes that the rejections were obviated by the amendment of claims, and t he application is now in condition for allowance: therefore, reexamination, reconsideration and al lowance of the claims are respectively requested. If there are any additional comments or require ments from the examination, the applicant asks for a non-final office action.

The Commissioner is hereby authorized to charge payment of any additional fees associat ed with this communication, or credit any over-payment to Deposit Account No. 16-0310.

Very truly yours,
Park & Sutton LLP

Dated: 5/31, 2005

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MARKED-UP VERSION OF CLAIM AMENDMENTS

Claim 1. (Currently amended) An adjustably opaque window component comprising:

~~a) an external pane;~~

~~b) an internal pane;~~

a) ~~c)~~ a light transmission control layer; and

b) ~~d)~~ a shock absorbing layer;

wherein ~~the~~ an external ~~pane~~ wall of the window component and ~~the~~ an internal ~~pane~~ wall of the window component provide a cavity between them, wherein the light transmission control layer and the shock absorbing layer are positioned in the cavity, wherein the light transmission control layer is supported by the shock absorbing layer.

Claim 2. (Currently amended) The adjustably opaque window component of claim 1, wherein the shock absorbing layer comprises a first flexible sheet, and the light transmission control layer is attached to the first flexible sheet.

Claim 3. (Currently amended) The adjustably opaque window component of claim 2, wherein the ~~first flexible sheet~~

shock absorbing layer is made of ~~polyester, or polycarbonate~~ flexible plastic.

Claim 4. (Currently amended) The adjustably opaque window component of claim 2, wherein the thickness of the ~~first flexible sheet~~ shock absorbing layer is in a range from about 0.1 to about 0.2 mm.

Claims 5. - 6. (Cancelled)

Claim 7. (Currently amended) The adjustably opaque window component of claim 2, wherein the light transmission control layer comprises a plurality of light transmission control cells.

Claim 8. (Currently amended) The adjustably opaque window component of claim 7, wherein the light transmission control cells are arranged to form a ~~lattice~~ tiling.

Claim 9. (Currently amended) The adjustably opaque window component of claim 7, wherein the opacity of the light transmission control cells is variably adjustable.

Claim 10. (Currently amended) The adjustably opaque window component of claim 9, wherein the opacity of each of the light transmission control cells is adjusted by changing amplitude of electric field applied on the light transmission control cell.

Claim 11. (Currently amended) The adjustably opaque window component of claim 9, wherein each of the light transmission control cell comprises a first electrode, a second electrode, and an electro-optic material in between the first and second electrodes.

Claim 12. (Currently amended) The adjustably opaque window component of claim 11, wherein the electro-optic material comprises liquid crystal, or nonlinear optical material.

Claim 13. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material comprises dichroic dye doped liquid crystals.

Claim 14. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or

nonlinear optical material comprises nematic liquid crystals with chiral dopants.

Claim 15. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material comprises nematic liquid crystals without chiral dopants.

Claim 16. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material comprises chiral nematic liquid crystals.

Claim 17. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material comprises polymeric liquid crystals.

Claim 18. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material comprises ferroelectric liquid crystals.

Claim 19. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material is doped with dichroic light absorbing dye.

Claim 20. (Currently amended) The adjustably opaque window component of claim 12, wherein the liquid crystal or nonlinear optical material is doped with pleochoric light absorbing dye.

Claim 21. (Currently amended) The adjustably opaque window component of claim 12, further comprising a first polarizing layer that is positioned between the external pane and the light transmission control layer, and a second polarizing layer that is positioned between the first flexible sheet and the interior pane; wherein the direction of polarization of the first polarizing layer is substantially perpendicular to the direction of polarization of the second polarizing layer.

Claim 22. (Currently amended) The adjustably opaque window component of claim 21, wherein the first polarizing layer is integrated with the external pane, and the

second polarizing layer is integrated with the internal pane.

Claim 23. (Currently amended) The adjustably opaque window component of claim 21, wherein the first polarizing layer is absorptive.

Claim 24. (Currently amended) The adjustably opaque window component of claim 21, wherein the first polarizing layer is birefringence based.

Claim 25. (Currently amended) The adjustably opaque window component of claim 21, wherein the light transmission cell further comprises a first electrode that is substantially adjacent the first polarizing layer, and a second electrode that is substantially adjacent the first flexible sheet, wherein the liquid crystal is positioned between the first electrode and the second electrode.

Claim 26. (Currently amended) The adjustably opaque window component of claim 25, wherein the first electrode comprises a substantially transparent plastic substrate coated with transparent conductive coating,

and wherein the second electrode comprises a substantially transparent plastic substrate coated with transparent conductive coating.

Claim 27. (Currently amended) The adjustably opaque window component of claim 25, wherein the surface of the first electrode, which is adjacent the liquid crystal, is treated with a first polymer layer such that the first polymer layer gives a preferential alignment to the adjacent liquid crystal, and the surface of the second electrode, which is adjacent the liquid crystal, is treated with a second polymer layer such that the second polymer layer gives a preferential alignment to the adjacent liquid crystal.

Claim 28. (Currently amended) The adjustably opaque window component of claim 27, wherein the liquid crystals adjacent the first and second polymer layers are pre-tilted from the planes of the first and second polymer layers, wherein the preferential direction of the treated first polymer layer is substantially parallel to the direction of polarization of the first polarizing layer, and the preferential direction of the treated second polymer layer is substantially

parallel to the direction of the second polarizing layer.

Claim 29. (Currently amended) The adjustably opaque window component of claim 28, wherein the pre-tilting angle is in a range from 0° to about forty five degrees(45°)°.

Claim 30. (Currently amended) The adjustably opaque window component of claim 29, wherein the pre-tilting angle is about thirty degrees(30°)°.

Claim 31. (Currently amended) The adjustably opaque window component of claim 25, wherein the light control transmission cell further comprises a plurality of spacers, wherein the spacers maintain predetermined distance between the first and second electrodes.

Claim 32. (Currently amended) The adjustably opaque window component of claim 31, wherein all of the spacers are coated with adhesive.

Claim 33. (Currently amended) The adjustably opaque window component of claim 31, wherein part of the spacers are coated with adhesive.

Claim 34. (Currently amended) The adjustably opaque window component of claim 31, wherein the spacers are randomly distributed within the light transmission control cell.

Claim 35. (Currently amended) The adjustably opaque window component of claim 31, wherein each of the spacers comprises a sphere, and the sphere contacts the first and second electrodes.

Claim 36. (Currently amended) The adjustably opaque window component of claim 35, wherein the sphere is coated with an adhesive layer, wherein the diameter of the sphere is in a range from about five (5) to about thirty (30) microns, and wherein the thickness of the adhesive layer is less than about five (5) microns.

Claim 37. (Currently amended) The adjustably opaque window component of claim 9, wherein the first flexible sheet

is coated with transparent electrically conductive coating.

Claim 38. (Currently amended) The adjustably opaque window component of claim 37, wherein the transparent conductive coating is made of Indium Tin Oxide.

Claim 39. (Currently amended) The adjustably opaque window component of claim 37, wherein the transparent conductive coating forms an electrical wiring to each light transmission control cell.

Claim 40. (Currently amended) The adjustably opaque window component of claim 39, further comprising a control circuit that controls each of the light transmission control cells individually with the electrical wiring.

Claim 41. (Currently amended) The adjustably opaque window component of claim 39, further comprising a control circuit that controls the light transmission control cells collectively in part with the electrical wiring.

Claim 42. (Currently amended) The adjustably opaque window component of claim 39, further comprising a control

circuit that controls the light transmission control cells in whole with the electrical wiring.

Claim 43. (Currently amended) The adjustably opaque window component of claim 9, further comprising a light sensor that measures the intensity of the incident light, wherein the control circuit controls the light transmission of the light transmission control cells based on data provided by the light sensor.

Claim 44. (Currently amended) The adjustably opaque window component of claim 9, wherein the light transmission of the light transmission control cells is controllable manually.

Claim 45. (Currently amended) The adjustably opaque window component of claim 9, further comprising an array of photovoltaic cells, wherein the array provides electricity for operation of the light transmission control layer.

Claim 46. (Currently amended) The adjustably opaque window component of claim 45, wherein the adjustably opaque

window is a vehicle window, and wherein the array is installed in a vehicle.

Claim 47. (Currently amended) The adjustably opaque window component of claim 9, wherein the adjustably opaque window is an architectural window, a glass door, or a partition.

Claim 48. (Currently amended) The adjustably opaque window component of claim 9, further comprising an ultra violet light blocking layer that is positioned between the exterior pane and the light transmission control layer.

Claim 49. (Currently amended) The adjustably opaque window component of claim 2, wherein the opacity of the light transmission control layer is variably adjustable.

Claim 50. (Currently amended) The adjustably opaque window component of claim 49, wherein the opacity of the light transmission control layer is adjusted by changing amplitude of electric field applied on the light transmission control layer.

Claim 51. (Currently amended) The adjustably opaque window component of claim 2, wherein the shock absorbing layer further comprises a second flexible sheet, wherein the second flexible sheet is attached to the light transmission control layer opposite to the first flexible sheet.

Claim 52. (Currently amended) The adjustably opaque window component of claim 1, wherein the shock absorbing layer comprises gel that fill the cavity, and the light transmission control layer is supported in the gel.

Claim 53. (Currently amended) The adjustably opaque window component of claim 1, wherein attachment among the external pane, the internal pane, the light transmission control layer, and the shock absorbing layer is done with pressure sensitive adhesive.

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